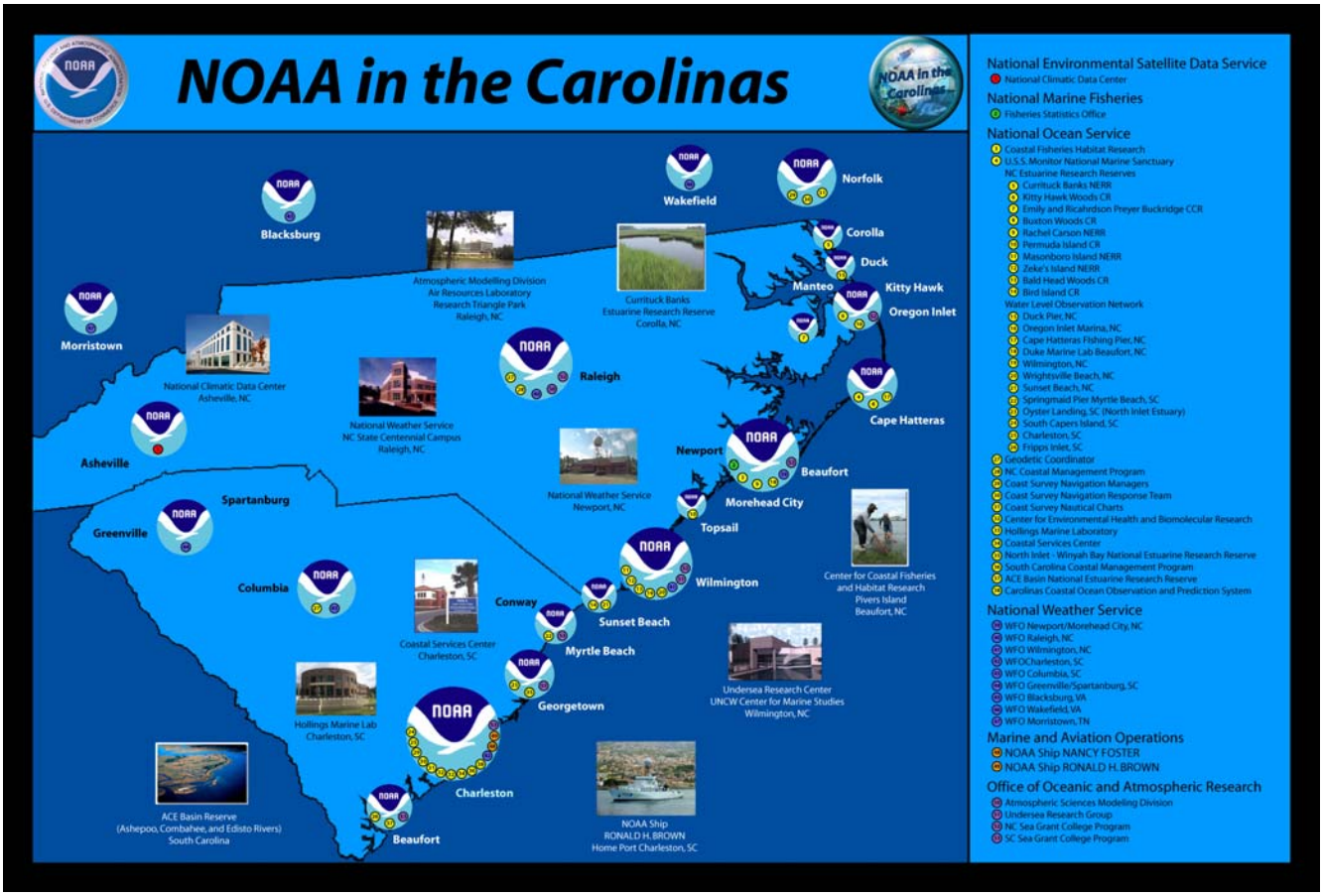
NOAA IN THE CAROLINAS: A Regional "OneNOAA" Collaboration



REPORT FROM 2005 ANNUAL MEETING
NATIONAL CLIMATIC DATA CENTER
ASHEVILLE, NC
NOVEMBER 2-4, 2005

EXECUTIVE SUMMARY

National Oceanic and Atmospheric Administration (NOAA) strategic and operating plans are founded on close working relationships inside and outside NOAA at the national, regional and local levels. Vice Admiral Conrad Lautenbacher, NOAA administrator, expresses a *OneNOAA* vision, wherein program planning and execution are not constrained by bureaucratic "stovepipes." The core objective of *OneNOAA* is to provide the most efficient and effective products and services for the nation.

NOAA in the Carolinas (NinC) is a *OneNOAA* effort. The **2005 second annual NOAA in the Carolinas meeting was held November 3-4, 2005 at the National Climatic Data Center, Asheville, NC**. Regional NOAA offices and programs in the Carolinas collaborate on many interdisciplinary projects, for example: improving rip current safety; developing better flood and storm-surge models, predicting climate change impacts, and identifying changing coastal demographics and impacts on the coastal environment. The agenda included 1) *plenary presentations* to highlight such exemplary projects and 2) *moderated working groups* to define what it means to work as a corporate *OneNOAA* on a regional level, and to identify new regional partnerships. Specific meeting objectives included: to better serve public needs through more efficient, effective, and accessible NOAA services and products; to understand and embrace a *OneNOAA* vision; and enhance the regional role in NOAA's Program Planning, Budgeting, and Execution System (PPBES).

Thirty-seven participants came from five states and all NOAA line offices. In addition to this report, outcomes included:

- Improved understanding regarding regional partnership efforts, how to enhance regional participation in PPBES, and how to develop regional OneNOAA culture and approach.
- Objectives and partners were identified for four new "big ideas" that are highly relevant at the regional and national levels, including: 1) Coastal Inland Flood Observing and Warning Project (CIFLOW) in the Carolinas, 2) Coastal Erosion and Inundation, 3) Impacts of Hydrologic Change on Ecosystem Health and Water Use, and 4) Environmental Quality.
- Ten immediate new partnership projects were discussed and enabled by the meeting, for example, partnerships between coastal observing programs and Weather Forecast Offices to add more offshore observations to coastal forecasts, and development of regional OneNOAA Outreach Efforts (NOAA-wide exhibit at NC and SC Seafood festivals, use NOAA in the Carolinas web site as link for new partners).

Key messages to NOAA leadership were identified, including:

- NOAA in the Carolinas strongly supports the *OneNOAA* vision
- NOAA in the Carolinas welcomes guidance regarding the PPBES process, for example:
    - instructions as to how to submit cross-line office and cross-goal program projects into the PPBES planning process
    - current annual stakeholder meeting in DC is commendable as face-to-face opportunity; similar regional efforts are suggested to improve integration of regional partners (including extramural) into the PPBES planning process

  - Program Baseline Assessments and Program Plans should be made available, with understanding of how they can be used, to regional partners for their local planning and execution efforts
- *OneNOAA* should not entail elimination of partner identities; regional partners must also receive credit (e.g., news, use of logos).

Similarly, key messages to regional NOAA partners were developed, including:

- Regional partners are primarily the "E" in PPBES, however, regional partners must also know where to fit in the NOAA Strategic Plan and program plans and goals, and the PPBES process; all partners should review the existing *OneNOAA* slide materials (located at http://www.pco.noaa.gov).
- Regional partners should commit to communicate the *OneNOAA* message and principles up and down their chains of command.

The next step is for specific initiatives and associated costs to be developed and presented to NOAA leadership.

NOAA in the Carolinas Steering Committee:

NC: Andy Shepard, NOAA Undersea Research Center- Southeast Region; Katie Mosher-Patterson, Jack Thigpen, NC Sea Grant; Tom Kriehn, Darin Figurskey, NOAA Weather Service; Rachel LoPiccolo, NOAA Fisheries
SC: Jeff Payne, NOAA Coastal Services Center; Bob Bacon, SC Sea Grant
NOAA Advisor: Dean Gulezian, NWS

GLOSSARY OF ACRONYMS:

AOP	Annual Operating Plan
Caro-COOPS	Carolinas Coastal Ocean Observing and Prediction System
CCMAH	Cooperative Center for Marine Animal Health
CIFLOW	Coastal Inland FLood Observation and Warning Project
CORMP	Coastal Ocean Research and Monitoring Program
COTS	NOAA Coastal Observation Technology System
CSC	NOAA Coastal Services Center
CWISE	Climate and Weather Impacts on Society and Environment
DEM	Digital Elevation Maps
DENR	NC Department of Environment and Natural Resources
DNR	SC Department of Natural Resources
DoD	Department of Defense
FEMA	Federal Emergency Management Association
FIRM	Flood Insurance Rate Maps
GIS	Geographic Information System
IOOS	Integrated Ocean Observing System
LIDAR	Light Detection and Ranging
NCCOS	NOAA Centers for Coastal Ocean Service
NCDC	National Climatic Data Center
NCDCM	NC Division of Coastal Management
NCFMP	North Carolina Floodplain Mapping Program
NCSU	North Carolina State University
NDBC	NOAA National Data Buoy Center
NERON	NOAA Environmental Real-time Observations Network
NERRS	National Estuarine Research Reserve System
NESDIS	NOAA National Environmental Satellite and Data Information Service
NGS	NOAA Geodetic Survey
NMFS	NOAA Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	NOAA Ocean Service
NPS	National Park Service
NSSL	NOAA National Severe Storms Lab
NURP	NOAA Undersea Research Program
NWLON	NOS National Water Level Observing Network
NWS	National Weather Service
OAR	NOAA Office of Oceans and Atmospheric Research
PPBES	Program Planning, Budgeting, and Execution System
SEACOOS	Southeast Atlantic Coastal Ocean Observing System
SECOORA	Southeast Coastal Ocean Observations Regional Association
SEFC	NMFS Southeast Regional Fisheries Center
SERFC	Southeast River Forecast Center
SG	Sea Grant
SP	Strategic Plan
SWMP	NERRS System-Wide Monitoring Program
UNC-CH	University of North Carolina at Chapel Hill
UNCW	University of North Carolina at Wilmington
USACOE	US Army Corps of Engineers
USC	University of South Carolina
USGS	US Geological Survey
WFO	Weather Forecast Office

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BACKGROUND

The National Oceanic and Atmospheric Administration (NOAA) strategic and operating plans are founded on close working relationships both inside and outside NOAA at the national, regional and local levels. Vice Admiral Conrad Lautenbacher, NOAA administrator, expresses this as the *OneNOAA* vision, wherein program planning and execution are not constrained by bureaucratic "stovepipes." The core objective of a corporate *OneNOAA* is to provide the most efficient and effective products and services.

NOAA offices and programs in North and South Carolina have collaborated on many cross line office, interdisciplinary projects, for example: improving rip current safety; developing better flood and storm-surge models, predicting climate change impacts, and identifying changing coastal demographics and impacts on the coastal environment. In 2004, a committee of NOAA representatives in North Carolina coordinated a similar meeting in Wilmington, NC, "*NOAA in North Carolina*," to highlight these and other NOAA partnership efforts, and to recommend new potential research and outreach efforts. The resulting report is available online at the new *NOAA in the Carolinas* Web site (http://www.erh.noaa.gov/mhx/NOAACarolinas/NOAACarolinas.html).

In April 2005, the 2004 meeting results were summarized for the NOAA Goal Team leadership at a presentation in Silver Spring. The leadership endorsed this grass-roots approach to *OneNOAA* and encouraged the team to expand regionally.

2005 ANNUAL MEETING

The 2005 *NOAA in the Carolinas* second annual meeting was hosted by the NOAA Climatic Data Center, Asheville, NC and began with a tour of NCDC at on Wednesday, November 2. On Nov. 3-4, the agenda included: 1) keynote address by a NOAA chief of staff, Scott Rayder, describing the agency's strategic vision and priority goals; 2) plenary presentations of partnership projects in the Carolinas that exemplify the *OneNOAA* vision; and 3) moderated working groups to constrain what it means to work as a corporate *OneNOAA* on a regional level, and to identify new regional partnerships. Thirty-seven participants (Figure 1) included representatives from five states and all NOAA line offices.

MEETING PURPOSE:

As stated by Dr. Ron Hodson, director of NC Sea Grant and initiator of the 2004 NOAA in NC meeting, *"Collaboration and partnerships are no longer lofty goals. They are an economic reality to save time and money, and avoid duplication of efforts."* Additional specific objectives of the NOAA in the Carolinas project include:

- To understand and embrace a *OneNOAA* vision
- To enhance the regional role in NOAA planning and implementation (PPBES)
- To better serve public needs through more efficient, effective, and accessible NOAA services and products.

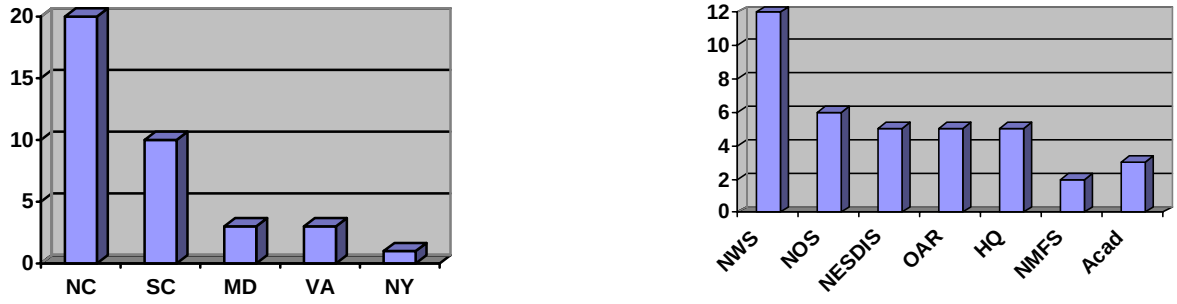

Figure 1. Thirty-seven (37) participants from 5 states (left) and all NOAA line offices (right), plus a few academic partners involved with large NOAA grants.

OBJECTIVES:

OUTCOME 1: **Increased awareness** of regional efforts and enhanced effectiveness in NOAA planning and execution processes

Objectives:

a) Assess level of understanding regarding regional efforts at multiple levels: a) national influence on the region level; b) within the region; and c) regional influence on the national level;
b) Assess level of understanding and effectiveness of regional participation in NOAA planning, integration, and execution processes;
c) Develop regional culture and approach (best practices) for *OneNOAA*.

Outcome 1/Breakout 1 Process:

- Three pre-assigned working groups (mix of line offices and disciplines), each with facilitator and recorder
- Based on results from pre-meeting survey, two tasks included: 1) identify and articulate key issues needing attention, and ways to address these issues; 2) Identify commonalities and best practices for *OneNOAA* approach.

OUTCOME 2: Development of **new *OneNOAA* partnerships**

Objectives:

a) Develop new *OneNOAA* projects that exemplify best practices
b) Identify new partners for existing *OneNOAA* projects.

Outcome 2/Breakout 2 Process:

- Two working groups by NOAA Goals- 1) Climate and Weather/Water, and 2) Ecosystems
- Two tasks: 1) PROGRAM ADJUSTMENT: identify regional hot topics of national importance and *develop at least one* related new BIG idea per NOAA goal; 2) ADD A PARTNER: identify new partners for existing projects

OUTCOMES AND RECOMMENDATIONS:

Thirty-seven participants came from five states and all NOAA line offices (Appendix A). The final agenda is in Appendix B. Breakout group notes are included in Appendix C. Partnership project templates submitted prior to the meeting are included in Appendix D.

This report and other meeting materials (e.g., presentations) are included on a CD and will be posted on the NinC Web site (http://www.erh.noaa.gov/mhx/NOAACarolinas/NOAACarolinas.html).

Key Messages:

Key messages to NOAA leadership were identified, including:

- NOAA in the Carolinas strongly supports the *OneNOAA* vision
- NOAA in the Carolinas welcomes guidance regarding the PPBES process, for example:
    - instructions as to how to submit cross-line office and cross-goal program projects into the PPBES planning process
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    - Program Baseline Assessments and Program Plans should be made available, with understanding of how they can be used, to regional partners for their local planning and execution efforts
- *OneNOAA* should not entail elimination of partner identities; regional partners must also receive credit (e.g., news, use of logos).

Similarly, key messages to regional NOAA partners were developed, including:

- Regional partners are primarily the "E" in PPBES, however, regional partners must also know where to fit in the NOAA Strategic Plan and program plans and goals, and the PPBES process; all partners should review the existing *OneNOAA* slide materials (located at http://www.pco.noaa.gov).
- Regional partners should commit to communicate the *OneNOAA* message and principles up and down their chains of command.

Outcome 1a and b-- Increasing Awareness:

Discussions focused on two areas: 1) awareness of *OneNOAA* and related activities at the national and regional levels and 2) defining what makes a good *OneNOAA* project. Following is a summary based on the pre-meeting survey questions:

1. **How familiar are you w/ the NOAA Strategic Plan?** Most were familiar, but did not routinely use the SP for local plans and operations. The need to do so was acknowledged but the practical nature of how to make an impact was not clear. This could be encouraged by becoming more involved in writing and updating the plan according to the annual PPBES process. Most participants had not engaged in the current process for incorporating stakeholder input.

2. How familiar are you with the NOAA PPBES process? Most people were familiar, although this was heavily weighted by NWS offices, which spend more time than most training at the regional level. There is significant confusion over where regional partners can and should fit into the process.

3. How familiar are you with the "OneNOAA" vision? Most expressed familiarity, in part because partnering is common at local levels and the notion is intuitive. However, most of participants were upper level managers and "lower levels" of the organization may not be as familiar or have heard of the concept. More work is needed to explore and understand the cultural change objectives and impacts.

4. Does NOAA PPBES work for <u>me</u>? There is some evidence that the concept works on the Hill, but general perception was that it is does not work well locally. Some questioned whether it needs to; perhaps it is not designed or intended to control all local operations and decision-making. Knowledge is powerful and the general consensus is that most regional partners want to be more knowledgeable and engaged in the appropriate stages. *The process is very fast paced especially at certain times, and the decision making parts are not well understood at the regional level, thus it tends to be a black box. In addition, operating units in the field noted that although the PPBES is structured around goals, there is less connection and relevance when the annual operating plans and budgets are developed and executed as more of a line office response.*

5. Are NOAA programs in the Carolinas closely aligned in planning/execution of their missions? Just as there is not enough understanding of the national process and plans, there is too little understanding of our local partners Strategic and Annual Operating Plans; these should be shared as appropriate among regional partners in a timely fashion. *Plans are often made in good faith, and then the operating plans do not reflect the nature and level of commitment that is necessary to truly partner on projects and strategic aims.* Some offices work well together by necessity (e.g., weather and climate programs), but this is less true for non-traditional partners (e.g., weather and fisheries programs).

Outcome 1c--Model *OneNOAA* Efforts:

Suggested *OneNOAA* efforts are at two levels: 1) organizational and 2) project. The Eastern Region of the NWS provides a model for how other NOAA elements may encourage the culture across their organization. Their efforts include: PPBES training at local offices led by upper management, including use of existing training materials; close alignment of all daily activities to NOAA goals; and integration of related metrics into NWS managers' annual performance evaluations.

What makes a good *OneNOAA* project? The meeting included project presentations that exemplify the *OneNOAA* intent of integration of service and product delivery, outreach, and communication, across NOAA offices and disciplines—they breakdown the stove-pipes. The most apparent and important elements of these efforts include:

- **Self-generated and shared leadership** that strengthens capacity to deliver services and manage risk;

- **Leveraged** to meet needs through **intentional integration of partners'** knowledge, priorities, and resources;
- **Uniquely focused** on end-user role in design and delivery;
- **Contextualized for the region**, including special effort to integrate *community knowledge* and practice/culture with modern science and technology; and
- **Receptive point of access** for new local, regional, national and international partners.

The *OneNOAA* model project is not just coordinated, but **truly collaborative**, characterized by **shared risk, shared resources, and shared recognition**.

Outcome 2a- New Partnerships:

Four new "big ideas" were developed that are highly relevant at the regional and national levels:

CIFLOW in the Carolinas:

Objectives:
- Integrate and expand river basin hydrology, stream flow and coastal storm surge observations
- Explore new technologies for rainfall observations and application in region (e.g., Dual Doppler polarization)
- Develop and couple hydrologic, atmospheric and oceanic regime models to predict, for example, rainfall, hydrologic flow, and storm surge
- Estimate socio-economic impacts of the program.

Partners:
- NOAA: NWS (Office of Hydrological Development, River Forecast Centers, WFOs), OAR (NSSL, Sea Grant), NOS (COTS, CSC, NGS), NDBC
- Other: SECOORA, USGS, USACOE, State (Emergency Managers, State Flood Mapping programs, DNR/DENR- Division Water Resources in SC and NC), FEMA, NPS.

Coastal Erosion and Inundation:

Objectives:
- Expand observations and modeling efforts for sea level rise, erosion, and inundation events
- Improve monitoring and predictions of storm surge models
- Assess impacts of mitigation measures on coastal ecosystem health (e.g., nearshore Essential Fish Habitats)
- Estimate socio-economic impacts of the program
- Improve and expand outreach/extension of information to end users.

Partners:
- NOAA: NOS, NERRS, NGS, CSC, NPS, DoD (bases), NCDC/SE Regional Climate Center
- Other: USGS, USACOE, State Water Resources, FEMA.

Impacts of Hydrologic Change on Ecosystem Health and Water Use:

Objectives:

- Provide local managers with better information and scenario products related to future climate impacts on water supplies and infrastructure
- Improve inland predictions of the impacts of extreme events
- Estimate socio-economic impacts of the program
- Increase outreach to improve action plans, policies and response to impending disasters, e.g., compendium of success stories of local communities' proactive responses to disasters.

Partners:

- NOAA: NOS (NERRS, NGS), NCDC, NWS
- Other: USGS, USACOE, State Water Resources, SE Regional Climate Center, FEMA, local managers (e.g., state climatologists, water managers, developers), NPS.

Environmental Quality:

Objectives:

- Assess water and air quality (e.g., dissolved oxygen, atmospheric deposition, pathogens)
- Estimate rainfall amounts, rates and runoff
- Develop environmental quality indices that will enable rapid assessment of impacts and responses
- Develop related models specific to various watersheds
- Acquire more protected areas and reference sites (e.g., NERRS)
- Effectively utilize climate reference network and NWS climate composites
- Model and understand long-term impacts of coastal and inland flooding
- Assess socio-economic impacts of related programs
- Develop new outreach and education products and services.

Partners:

- NOAA: Sea Grant, NERRS, NWS, NCDC, NOS
- Other: State (DENR), local managers, academic programs (e.g., Lower Cape Fear River Program).

Outcome 2b- New Partners on Existing Projects:

In addition, immediate new partnerships and projects discussed and enabled by the meeting included:

- CaroCOOPS/CORMP observing programs: new partners with NWS/WFOs across region to build on *Carolinas Coast* project; seek to partner with NERON (NOAA Environmental Real-time Observations Network) to add coastal ocean stations to mostly land-based system
- CIFLOW: new partners with NWS/WFO, NCSU, and Sea Grant; new SG extension specialist going to NSSL; will coordinate with SERFC
- SC WFO: new partners with NC and SC Geol. Survey to develop and use landslide probability maps
- NC NERRS: System-wide Monitoring Program integrate with other IOOS in NC (e.g., CORMP, Lower Cape Fear River Program)
- CSC: GIS training offered to NOAA partners as practical; coordination of storm surge programs and models including NWS national team; discuss more at Hurricane Conference
- Pivers Island planning: CSC would like to join; NWS would like to join; potential Sea Grant partnership

- Coastal climatologies—sea breeze climatology and other developments require outreach by CSC and increased exposure, potential link for NWS and Sea Grant (NC/SC)
- NCCOS: looking at new NWS partnership (Charleston and others) and NSSL; recent spread of sea turtle disease from tropics to NC may relate to climate change; similar issue may relate to recent lionfish invasion, in partnership with NOAA Fisheries- Southeast Fisheries Center (SEFC)
- *OneNOAA* Outreach Efforts: NOAA-wide exhibit at NC and SC Seafood festivals; use NOAA in the Carolinas web site as link for new partners
- NC Height modernization: CORMP and NERRS will likely partner to provide observations.

NEXT STEPS:

Led by a steering committee of volunteers from various NOAA programs (inset), the following NOAA in the Carolinas action plan is anticipated over the coming year:

- Early Dec.- SES retreat involving Dean Gulezian (more info on NOAA briefing dates)
- Dec. 9, 2005- Steering committee de-brief, nominees for new members
- Dec 31, 2005- meeting CD with presentations and report
- April 2006- Briefings, e.g., A.A.s, Goal Team, Councils, Sea Grant NOAA-wide Brown Bag Seminar in Silver Spring
- Jan. 31, 2006- Update on new partnerships that may result from the NOAA in the Carolinas
- June 30, 2006- Update on new partnerships that may result from the NOAA in the Carolinas
- Mid-Nov. 2006- Charleston, SC, 2006 NOAA in the Carolinas meeting.

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APPENDIX B: AGENDA

Nov. 2, 2005 **NCDC Asheville, NC**

4:00-5:30 pm: NCDC Tour
6:00-8:00: Reception

Nov. 3, 2005 **NCDC**
9:00 - 9:10 Welcome: Thomas Karl, NCDC
9:10 – 9:40 Meeting Overview: Andy Shepard, NOAA Undersea Research Center at UNCW
9:40 - 10:15 Keynote: Scott Rayder, NOAA Chief of Staff, "One NOAA Vision"
10:15 - 10:30 Coffee Break
10:30 - Noon NOAA in Carolinas partnership presentations:

- Dr. Aleta Hohn, *Assessing health of dolphins and sea turtles along the coast of the Carolinas*
- Dr. Kevin Kelleher, *Coastal Inland FLood Observation and Warning Project (CIFLOW)*
- Carolinas Ocean Observing Systems:
  - Dr. Marvin Moss, *Coastal Ocean Research and Monitoring Program (CORMP)*
  - Dr. Madelyn Fletcher—*Carolinas Coastal Ocean Observing and Prediction System (CaroCOOPs) and the Carolinas Coast Web Project*;
- Dr. Len Pietrafesa, *Climate & Weather Impacts on Society & the Environment (CWISE)*

12:00 – 12:15p Dean Gulezian, NWS, presented award to Grant Goodge, NCDC, for dedication to Cooperative Observer Program and public service
12:15 – 1:30 Lunch
1:30 – 2:00 Model *OneNOAA* in the Carolinas, Jeff Payne, NOAA Coastal Services Center
2:00 – 2:15 Breakout process: expected outcomes and products, Breakout 1 tasks
2:15 – 5:00 Breakout 1—What is OneNOAA in the region?
5:00 - 5:30 Plenary report

Nov. 4, 2005 **NCDC**
8:30 – 9:00 Plenary— Breakout 2—New OneNOAA Partnerships
9:00 – 10:45 Breakout 2
10:45 - 11:00 Coffee
11:00 – 11:30 Plenary—report out from Breakout 3
11:30 – 12:30p Final Plenary—Messages to NOAA, **Adjourn**

APPENDIX C: BREAKOUT GROUP NOTES

Breakout 1- What is OneNOAA?:
Green Team C1
Red Team C4
Blue Team C6
Breakout 2- New Partnerships:
Ecosystems C8
Climate and Weather/Water C10

BREAKOUT 1 (What is OneNOAA?)-- GREEN TEAM:

Facilitator: Darin Figurskey, NWS/FO-Raleigh, NC
Recorder: Jack Thigpen, NC Sea Grant

How familiar are you with the NOAA Strategic Plan?

Familiarity with the NOAA Strategic Plan varied among line offices. The National Weather Service, NERRS and Sea Grant generally have operational plans at various levels of those organizations that stem from the NOAA Strategic Plan or NOAA key goals. Other representatives from other line offices were not highly aware of the NOAA Strategic Plan, NOAA goals, or the One NOAA vision. It appears that academic partners can review the NOAA Strategic Plan though they tend not to create their individual plans from the NOAA Strategic Plan. The key points from discussion of this question were that field workers feel they have little input into NOAA strategic planning, and most importantly, for One NOAA to work, the NOAA Strategic Plan has to become important in every line office at all levels of the organization.

Potential action items for NOAA in the Carolinas: promotion of One NOAA vision through fact sheets, short Powerpoint presentations, marketing of NOAA in the Carolinas web page on this topic, etc.

PPBES?

Consensus among the group was that PPBES was not well understood, and by some not understood at all. In fact, one representative from one line office stated, "[I have] never heard of it until today." The key points from this discussion, particularly after the keynote presentation by Scott Rayder, were that to further efforts of NOAA in the Carolinas, education was needed on PPBES, along with a need for a knowledgeable champion to help guide the group into and through the PPBES process.

Potential action items for NOAA in the Carolinas: increased knowledge of PPBES through fact sheets, short Powerpoint presentations, marketing of NOAA in the Carolinas web page on this topic, etc. Probably not an efficient use of resources to immerse field personnel too much into PPBES; more detailed assistance into PPBES would be required by the steering committee through the guidance of a knowledgeable champion.

How familiar are you with the "One NOAA" vision?

As discussed in the first question, familiarity varied among line office representatives. It was recognized there is similar work being done in NOAA line offices that could be consolidated or done more efficiently through line office cooperation. Most agreed that the One NOAA concept has value. Many, though, gave negative comments on how One NOAA was being implemented. Removal of line office logos from presentations, forced telephone answering with the acronym "NOAA", and apparent lack of buy-in from high-level officials in some line offices do not help to gather support for One NOAA at the field level. Along with attempts by NOAA to become more holistic, sensitivity to the identity of line offices is needed by high-level officials. Overall, buy-in from Assistant Administrators, sensitivity to line office loyalty, more One NOAA success stories, and proof of success that One NOAA is leading to more funding and recognition of NOAA by Congress are all important factors in adding support for One NOAA at the field level.

Potential action item for NOAA in the Carolinas: mention of group concerns on this issue in final report to NOAA.

Does NOAA PPBES work for me?

Since consensus among the group was that PPBES was not well understood, and by some not understood at all, the key point from this discussion was it was difficult to determine if PPBES works. To determine if PPBES works for the field, a better frame of reference is needed. This requires education on the subject.

Potential action items for NOAA in the Carolinas: increased knowledge of PPBES through fact sheets, short Powerpoint presentations, marketing of NOAA in the Carolinas web page on this topic, etc. Probably not an efficient use of resources to immerse field personnel too much into PPBES; more detailed assistance into PPBES would be required by the steering committee through the guidance of a knowledgeable champion.

Is there a better way for NOAA to integrate regional elements into the national planning process?

Discussion on this question focused, once again, on PPBES. It was felt that until NOAA in the Carolinas understands the planning process, it would be difficult to integrate regional elements better. Some comments mentioned the opposite thought, that further integration regionally was needed to add strength to the planning process. Consensus was that NOAA in the Carolinas needs to develop an education plan for PPBES.

Potential action items for NOAA in the Carolinas: increased knowledge of PPBES through fact sheets, short Powerpoint presentations, marketing of NOAA in the Carolinas web page on this topic, etc. Probably not an efficient use of resources to immerse field personnel too much into PPBES; more detailed assistance into PPBES would be required by the steering committee through the guidance of a knowledgeable champion.

Are NOAA programs in the Carolinas are closely aligned in planning of their missions?

Overall, it was felt that NOAA line offices are not closely aligned in planning of their missions. Although line offices are aligned simply by being part of NOAA and following, inasmuch as they are known, NOAA goals, on a day-to-day level there is not much coordination among different line offices in mission planning. Closer alignment in mission planning was considered a positive from a budgetary perspective.

Potential action items for NOAA in the Carolinas: advocacy of preparing local operating plans that include a component or components coordinated with other NOAA line offices.

Are NOAA programs in the Carolinas are closely aligned in execution of their missions?

Representatives from various line offices had a strong positive perception that there is some alignment in execution of missions. Partnerships are evolving to help execute initiatives, although there is no alignment of planning. The planning is done by one line office and then partnerships are developed with other line offices to help execute the plan. Consensus was that field organizations should involve partners more in planning, and not just from NOAA, but among customers and information providers.

Potential action items for NOAA in the Carolinas: advocacy of preparing local operating plans that include a component or components coordinated with, at a minimum, other NOAA line offices.

Do NOAA programs in the Carolinas have a One NOAA regional approach?

Although NOAA in North Carolina, and now NOAA in the Carolinas, has only been functioning for a couple of years, there appears to be a will to continue the efforts of the group. As a result, a One NOAA regional approach should only grow, and probably grow for the betterment of all line offices in the Carolinas. Just coming together for the workshop sets a good example, with some partnership projects, whether planned or opportunistic, achieving positive results for customers and for One NOAA.

Identifying an issue several or all have in common would benefit all NOAA offices in the Carolinas. Partly through "trial and error", since the group is trying to build a One NOAA culture, we are going to learn what works and what doesn't. We will determine efficiencies by our work with one another.

Various line office work with universities help bring line offices together. A key point was that One NOAA-type relationships are also very valuable for universities. Working with NOAA agencies provides opportunities for universities to get research into the community particularly through outreach, and that is very important to universities.

Finally, there was brief discussion on other agencies missing from the conference that could have been invited. These were:

i. NOAA Corps
ii. U.S. Coast Guard
iii. Coastal management agencies
iv. Marine Sanctuary Program

Action items for NOAA in the Carolinas: Identify an issue that several or all partners have in common and target that issue for planning and execution.

BREAKOUT 1 (What is OneNOAA?)-- RED TEAM:

Facilitator: Jeff Payne
Recorder: Katie Mosher-Patterson

Participants: Hohn, Benthall, Pietrafesa, Krauk, Emlaw, Caropolo, Siebers

Goal: Improving knowledge and role in PPBES and OneNOAA

1) How familiar are you with the NOAA Strategic Plan?
- Posters were sent out to NWS offices. Not received by NMFS or Sea Grant.
- Until staff understand why – where do I fit in – they won't bother.
- Umbrella document -- How relevant to the folks in the field.
- How do I align my activity with the plan? Which plan/version?
- Not reviewed on a daily basis – so wrapped up in getting the job done today.
- Pie in the sky or what are you responsible for fulfilling?
- How much time does it take?? Do not have a luxury of time?
- Implementation plan vs. strategic plans
- Role of mandates (marine mammal protection, ESA, etc.) determine the daily activities more so than the strategic plan.
- Some goals are not fully funded – looking for outside cooperation. Some are barely funded at all. In some cases Navy is funding most of a program.

2) How familiar are you with PPBES Process?
- Many scientific professionals perceive it as an administrative process with little return.
- Field folks get cynical – just a change in the way to do what has been done.
- Lack of training for agency folks.
- NWS briefed on process but we don't do anything to impact the process – not at our level. NMFS – upper levels try not to burden the entire staff with dealing with this.
- Don't want to tie up staff time – focus on branch chiefs (GS 13-15).
- Information does not trickle down in terms of how to interact with the process.
- Weather Forecast Office -- dealing with today and immediate, not three years out. Our focus is more incremental. Our discretionary funds are used for supplies, education and travel. We make a request to region level – they may interact with the PPBES system. Teams/ workgroups across NWS looking at forecasts improvements – report back.
- Funding PPBES vs. funding/mandates from Congress-- disconnect!

3) How familiar are you with the One NOAA vision?
- VADM has done an admirable job of sharing the OneNOAA phrase, but everyone may not understand on an operational activity.
- We still operate separately because we have missions and operations. Wish we had more discretionary time.
- Outreach – now looking at who we can pull in. Example: Festival booths. There has been a lot of reaching out.
- We don't always know what is going on across other offices. Are we aware of all the new gauges that could be available to provide data?
- Fewer buoys – better ID new ones or lost ones. Tide gauges – many are out there – not all on same network.
- Some regional 'coordinators' are in place? Where are they? Who do they report to? Why is their presence and their contributions not more of a mainstream knowledge base within NOAA?
- Some activities are specific to a line office and don't measure up to One-NOAA.
- Partnerships will be a cultural change.
- We are not always knowledgeable to know where to go to look for information for partnership.
- Aggregation with energy and knowledge needed to be more One-NOAA effective.

4) NOAA PPBES works for me?
- Why do we say it doesn't? We are not plugged in or involved.
- Our office budget is not connected to PPBES when it arrives in our office. We receive it organized by object class.

- PPBES is meant for the increased dollars (note: this particular sentiment not a consensus within the group). The visible result of the process appears to be negligible.
- The way we see funding come to us from Congress earmarks or NOAA line office-based Programs, Projects & Activities – not PPBES.
- Identify a new need – where do I go to ask for funding? Go through line office structure. I don't go directly to the PPBES goal lead. I need to stay within my protocol.
- Field unit does not have a plug into PPBES – requirements are not being actively, repeatedly solicited from the field.
- Long-term planning vs. accounting for current activities. Is it an operational requirement or legislative mandate?
- Rapid response – has to wait for supplemental appropriation if it cannot be handled in existing base budget.
- Can wait a year for a buoy site to come back – points up problem of adequate operational resources.

5) There is a better way for NOAA to integrate regional elements into the national planning process.

- PPBES process requires more staffing and time to implement. Current levels are not sufficient.
- Facility master planning may help, but working this is logistically difficult and individual requirements (place-based) for some units may be overriding criterion.
- Activities need to be place-based to function.
- Approach and fund ecosystems programs regionally – but do not necessarily locate all offices together.
- May not work for everyone to be in one location.

Question 6: NOAA in Carolinas programs are closely aligned in terms of planning and execution

- Desire – energy available.
- Knowledge of other programs in the Carolinas.
- Multi-state areas beyond Carolinas. Divided responsibilities.
- Logistics – People are busy all the time.
- Lack of perceived value-added – is it worth the time?
- Do you know the people well enough – interpersonal trust issues?
- Learning curve – planning and executing with extramural partners is time intensive and culturally challenging.
- New process – SC folks included this year.
- State-centric issues will not go away.
- We saw value in coming to this meeting.

8) Do NOAA programs in the Carolinas have a ONE-NOAA regional approach?

- Whose region are we in? IOOS regions may not include interior states.
- Common goals are the starting point. Making best use of resources for customers.
- End to end – research, to posting signs, to rescues.
- Routine meetings – establish contacts – familiarization interaction.
- Start small and build on success.
- Celebrate the success – Elevate and expand the results of ONE-NOAA collaboration successes. Get the word out.
- Identify attainable funding opportunities and low-hanging fruit.

BREAKOUT 1 (What is OneNOAA?)-- BLUE TEAM:

Facilitator: Andy Shepard, NURP
Recorder: Rachel Lo Piccolo, NCCOS
Reporter: David Wert, NWS

How familiar are you w/ the NOAA Strategic Plan?

Most expressed knowledge of the NOAA SP, but desire to better understand priorities and how to integrate plan into regional programs. One way to improve use would be to integrate regional partners more closely into writing of the plan. A single stakeholders meeting in DC is not enough.

How familiar are you w/ the NOAA PPBES process?

In general, there is only passing knowledge of the PPBES process, usually poor impressions based on personal interactions with staff involved in the Beltway. NWS does a good job through its eastern regional office of informing local WFOs about the process and soliciting input. They are far more familiar that other line office partners-- pull their answers from survey and far fewer people are familiar. It is not clear exactly where partners should fit—execution is obvious, but how much can they be involved in planning, especially partners outside NOAA (e.g., grantees and contractors) who are not allowed to see budget numbers in planning stages.

How familiar are you w/ the "One NOAA" vision?

Most considered the concept to be generally intuitive and something that happens more routinely at local levels than the Admiral might know, minus the label (one reason to have meetings like NinC!). The concept as expressed by the UnderSecretary is probably not familiar to lower organizational levels. The concept needs to be entrained by middle management and expressed to all employees, even to the point of integrating it into their work performance evaluations.

Does NOAA PPBES work for me?

Most considered that the concept works better on the Hill than in the field, but does it need to? There is a distinction between planning and budget/execution (see above). Again, all can stand to learn from NWS Eastern Region efforts to engage and inform the workforce regarding the process and goals, and to match them up with all daily activities. These efforts include 1 or 2 meetings each year at each WFO. These meetings describe PPBES, encourage partnerships, and gap analysis-- what are we not doing that we need to in order to meet SP goals/objectives?

Is there is a better way for NOAA to integrate regional elements into the national planning process?

All agreed that the answer is yes, thus their interest in NinC meeting; related ideas are included above.

Are NOAA programs in the Carolinas closely aligned in planning of their missions?

There is very little cross-program input or familiarity with each other's Annual Operating Plans (AOP) or Strategic Plans (SP), if applicable. NinC could serve as a good avenue via Web site to post and provide access. There is also fewer non-traditional partnerships (e.g., Fisheries and NWS); a NOAA-wide forum like NinC can help build more inter-disciplinary approaches and successes.

Are NOAA programs in the Carolinas closely aligned in execution of their missions?

Many are closely aligned by necessity, without an official mandate to work together (e.g., NWS/WFOs and ocean observing programs with buoys and data). Both OneNOAA budgeting and execution can be improved.

Do NOAA programs in Carolinas have OneNOAA regional approach?

Many participants did not answer the question due to minimal exposure to what the "OneNOAA approach" is. Partnerships are evidenced by shared resources and agreements; IOOS is doing it very well through routine meetings. Most projects could always benefit from a new partner willing to share resources. the NinC regional meeting is an excellent attempt to adopt the concept.

NOAA Take Home Messages and Recommended Actions:

- We want NOAA higher up to encourage/facilitate forging of new relationships/partnerships
- NOAA should provide opportunities for different groups to interact-from which communication will improve
- Forum should be routine, dedicated, cross state
- NOAA 10-15 min video clips of One NOAA concept-useful in the field offices as public outreach
- Leadership accountability (vertically, horizontally, top down/peer-peer)
- Review PPBES (the concept, how/why primer) NWS has a powerpt presentation; not just by web access (someone needs to be there in person to explain logically)
- OneNOAA—improved integration of workforce in planning. Solutions:
    - Share AOPs/ SPs (Draft/ Final)
    - Regional Collaborative Council
    - SES Retreats/workshops.
- OneNOAA-- workforce understands their connection and how they fit into NOAA SP. Solutions:
    - Senior leadership must initiate and get from mid management to workforce, "Senior leadership needs to create the culture"
    - Culture that seek out and enables partnerships (e.g. provide incentives via evaluation process)
    - Paradigm model-presentations to SES, AAs, Goal Teams, Councils
    - AOPs-should we be sharing? Could familiarize other groups w/ priorities
    - maybe even look at a draft form-may create new goals across agencies
    - Create a regional collaboration council to review SPs/AOPs to find overlap.

BREAKOUT 2 (New Partnerships)—ECOSYSTEMS:

Facilitator: Jeff Payne, NOAA/CSC
Reporter: Tom Kriehn, NWS/FO Newport, NC
Recorder: Katie Mosher, NC Sea Grant

Participants: Rebach, Siebers, Emlaw, Gabric, Hohn, Caropolo, Ellin, Figurskey, LoPiccolo

I. Summary Overview: Integrating Idea – Environmental Quality

Objectives:
- Assess water and air quality (e.g., dissolved oxygen, atmospheric deposition, pathogens)
- Estimate rainfall amounts, rates and runoff in a regional geographic boundary
- Develop environmental quality indices that will enable rapid assessment of impacts and responses; build on indices being created nationally
- Develop models specific to watersheds
- Acquire more protected areas and reference sites (e.g., NERRS)
- Expand climate reference network and NWS climate composites
- Model and understand impacts of coastal and inland flooding
- Assess socio-economic impacts of related programs
- Develop new outreach and education products and services

Partners:
- NOAA: Sea Grant, NERRS, NWS, NCDC, CSC
- Other: State (DENR), local managers, academic programs (e.g., Lower Cape Fear River Program)

Expanded Notes for Environmental Quality

Issue Sub-component: Water Quality and Air Quality

- Shellfish closures – use NWS rainfall data to assist with determining closures; target reducing uncertainty and increasing days open to harvest
- Impacts on economy
- Link with DMF and shellfish sanitation; pathogens
- Build concept from existing IOOS example for Lake Michigan, Illinois (SwimCAST) – reductions in beach closures for e-coli based on predictive capacity including site sampling and modeling using physical measurements
- Run-off from farms – tracking diseases from domesticated animals moving into new ecosystems and new species (turtles and dolphins) – NERRS and UNC-CH (Paerl) working on Sea Grant-funded project re: monitoring at new egg farm
- Dissolved oxygen measures – low DO can lead to algal blooms and other fisheries impacts
- Assess geospatial data needs
- Wind direction, precipitation, and links to nutrient (nitrogen) deposition

Issue Sub-component: Coastal Development
- Nonpoint source pollution
- Impacts on coast from up the watershed
- Land-use planning – where people live and where they build
- 'Smart rebuild'
- Social Science influence – coastal communities, population dynamics
- Land acquisition and reference sites (i.e. NERRS)

Issue Sub-component: Hazards
- Storms – coastal storm surge and event related inland flooding
- Storm-Ready Communities – working relationship between NWS and communities – establish a board; get better ratings for flood insurance; positive for communities; also tsunami-ready communities; all hazards radio

- Mitigation – ex: marsh areas restoration to reduce impact
- Impacts – short and long term ecosystem impacts after major storms
- Invasive species – function of habitat changes and impacts on native species; Example: lionfish, phragmites
- Climate impacts and other geospatial data needs; climate composites

Some Considerations

- What are the resource manager needs?
- How can we better enable resource managers to access and use new results
- Can NOAA in the Carolinas website be the portal for information – links to various sources of data and programs
- What do people want to know about environmental quality?
- What baseline monitoring is underway and what is needed?
- CHPPS – already lists needs in NC – could find similar in SC
- Coastal hazards are a big topic now – is this where the funding is?
- End results must include products and training

II. Small Projects Discussion

- NOAA in the Carolinas web site: use it as a link for new partners
- CSC GIS training; NERRS training
- Pivers Island planning – CSC would like to join; NWS would like to join; potential Sea Grant partner
- Sea Breeze – need outreach for findings developed by CSC and partners; potential link for NWS and Sea Grant (NC/SC)
- Carolinas Coast – working with USC and UNCW – need one marine page/portal; working with observations, forecasting and modeling; could be model for other coastal weather offices
- Dolphins and turtles – looking at new NWS partnership (Charleston and others) and NSSL
- Climate information could relate to sea turtle disease – had been in tropical waters, but now in NC
- CI-FLOW – new SG extension specialist going to NSSL; coordinate with SE River Forecasting
- CORMP – NERRS will likely partner; NMFS wants to find out more for potential partnerships
- Marine Mammal projects – now SG and NMFS; modifications to gear to limit entanglements
- Seafood festival – need to get One-NOAA mission out to the folks staffing the booth; need to think in these terms for all other booths; COAST day in DE had a NOAA tent with all line offices Catch-Release – can share info at booths – SC folks can also give info/products at booths

  MESSAGE: Need to educate others in our programs, and work the One-NOAA message through our organizations; we do a lot of outreach but could do more – NOAA wide powerpoint is available on this topic at www.pco.noaa.gov; possible need for a brochure that identifies all the NOAA offices/programs in the Carolina; NOAA at Nauticus – is a NOAA coordinator; get lessons from Andrew Larkin.

BREAKOUT 2 (New Partnerships)—CLIMATE, WEATHER, WATER:

Facilitator: Andy Shepard, NURP
Recorder: Rachel LoPicciolo, NCCOS

NOAA "hot" issues:
- GEOSS
- Water and Air Quality
- Inundation and Freshwater

Sea level rise:
- Coastal inundation and erosion
- Long-term and high freq. events

CIFLOW in the Carolinas:
Objectives:
- Integrate and expand river basin hydrology, stream flow and coastal storm surge **measurements and models**
- assess causes and impacts of hydrologic change on **ecosystem health**
- explore **new technologies** for rainfall observations and application in region; Explore Dual Doppler is next step for rainfall estimation; dual polarization is the key development; Nexrad will be upgraded to vertical and horizontal polarization- funding issue; Excellent test-bed for related technologies
- integrate **data and information**
- **coupling models** (rainfall, hydrologic flow, storm surge—hydrologic/atmospheric and ocean regimes)
- estimate **socio-economic impacts** of the program

Partners:
- NOAA: NWS- Office of Hydrological Development, River Forecast Centers, WFOs; OAR- NSSL, Sea Grant; NOS- COTS, CSC, NGS; NDBC;
- Other Partners: SECOORA, USGS, USCOE; State- Emergency Managers, State Flood Mapping programs, DNR/DENR- Division Water Resources in SC and NC; FEMA, NPS

Coastal Erosion and Inundation:
Objectives:
- **improve monitoring and predictions** of storm surge models; SLOSH is being tested
- assess impacts of **mitigation measures** on ecosystem health
- estimate **socio-economic impacts** of the program
- improve **extension** of information to end users
- accurate measurement and modeling of sea level, erosion, and inundation events

Partners: USGS, USCOE, State Water Resources, SE Regional Climate Center, FEMA, NOAA—NOS, NERRS, NGS, NPS, DoD (bases)

Impact of Hydrologic Change on Ecosystem Health and Water Use:
Objectives:
- assess **water supplies and quality**
- provide local managers **better info and scenarios** related to future climate impacts on water supplies and infrastructure
- improve inland predictions of **extreme events**
- estimate **socio-economic impacts** of the program
- increase **outreach** to improve action plans, policies and response to impending disasters
- collect examples of **success stories** of local management proactive responses to disaster

Partners: USGS, USCOE, State Water Resources, SE Regional Climate Center, FEMA, NOAA—NOS, NERRS, NGS; local managers (e.g., state climatologists, water managers, developers); NPS; NMFS

ADD-A-PARTNER:
- CaroCOOPS desires NWS (WFOs) partnership across region to build on Carolinas Coast project
- CIFLOW will add NWS/WFO partnership, NCSU, Sea Grant

- WFO partnership with NC Geol. Survey partnership to look at land slides; expand to other agencies throughout region; need landslide probability maps; works with real estate developers
- USC vulnerability science assessments—universities; may integrate with landslide maps developed by WFO (ancient landslides often good sites to build)
- NERON (NOAA Env. Real-time Obs. Network)- Ken Crawford, HQ; mostly land stations; add ocean component (CaroCOOPS/CORMP); seeking partners to add equipment; $5 million/year budgeted (over $100M required nationally); expand to SC; attempting to integrate Meso-Nets
- Talks begun to integrate NERRS SWMP with other IOOS in NC (CORMP, Lower Cape Fear River Program)
- ***Employee exchange between NOAA partners in the Carolinas (see 2004)!!***

APPENDIX D: Pre-Meeting Partnership Project Templates

NOAA Goals: E = Ecosystem, W = Weather/Water, C = Climate, T = Transportation/Commerce, O = Outreach/Education

First PI	Title*	NOAA Goal**	Page #
Bandy	NOAA in the Carolinas Web site	O	D-2
CSC	GIS Training/Partnership on Future Projects	E	D-3
Currin	Island-wide Plan to reduce stormwater and aquaculture impacts to estuarine waters	E,W	D-4
Fletcher*	Carolinas Coast: A One-Stop Shop for Marine Observations in the Carolinas	W	D-5
Fletcher*	Carolinas Coastal Ocean Observing and Prediction System (CaroCOOPS)	All	D-6
Hohn*	Assessing the health of populations of dolphins and sea turtles along the coast of the Carolinas	E	D-7
Kelleher*	Coastal Inland FLood Observation and Warning Project	W	D-8
Kriehn	NOAA Traveling Exhibit: NC Seafood Festival	O	D-9
Larkin	NOAA @ Nauticus	O	D-10
Mitchell	Implementing the National Height Modernization System in NC	W,T,O	D-11
Moss*	Coastal Ocean Research and Monitoring Program (CORMP)	W,E,O	D-12
Payne & Bales*	Coastal Hazards and Climatologies: Integration Potential in the Carolinas	All	D-14
Pietrafesa*	Climate & Weather Impacts on Society & the Environment (CWISE) and Inter-Actively coupled NOAA Programs in the Carolinas	E,C,W	D-15
Rebach	Bycatch Reduction of Marine Mammals in Mid-Atlantic Fisheries	E	D-16
Rebach	Bottlenose Dolphin Take-Reduction Gear Research Program	E	D-17
Thigpen	Educating Anglers About Catch-and-Release in Highly Migratory Species Fisheries	E, O	D-18
Whitfield	Status and Risk posed by the invasive Indo-Pacific lionfish to North Carolina Hard bottom Communities	E	D-19

- **- Oral presentation at meeting—note Fletcher/Moss presentations are coordinated.**

PROJECT TITLE: ***NOAA in the Carolinas Webpage***

COLLABORATING PROGRAMS/ CONTACTS:

- NWS Newport, NC (Rich Bandy, ITO, and webmaster 252-223-5122)
- NOAA in Carolinas Steering Committee

BROAD NOAA CATEGORY:
__Climate; __Water and Weather; __Ecosystems; __Commerce/Transportation; X_Outreach and Education

PROJECT SUMMARY:
A NOAA in the Carolinas webpage has been created by the Information Technology Officer (ITO) at the National Weather Service Office in Newport, NC. The Forecast Office also hosts the website. The website serves two purposes: 1. First, it serves as an internal information exchange portal for NOAA entities involved in the NOAA in the Carolinas initiative. It contains a description of the NOAA in the Carolina initiative, its mission, and information concerning upcoming meetings and projects. 2. Second, the webpage serves as a point of entry for the public to learn about the various NOAA entities in the Carolinas with links to each one. It contains a map depicting the various NOAA entities in the Carolinas. The webpage also provides a regional perspective on the four main NOAA goals. The website can be viewed at

http://www.erh.noaa.gov/mhx/NOAACarolinas/NOAACarolinas.html.

PROJECT TITLE: ***GIS Training/Partnership on Future Projects***

COLLABORATING PROGRAMS/ CONTACT:
- NOAA Coastal Services Center (Contact: Cindy Fowler)
- NWS Charleston, SC (Contact: Frank Alsheimer)

BROAD NOAA CATEGORY:
__Climate; __Water and Weather; __Ecosystems; __Commerce/Transportation; _X_Outreach and Education

PROJECT SUMMARY:
NOAA Coastal Services Center is providing week long GIS training for the Charleston WFO Science Operations Officer at no cost to the NWS. NWS will likely participate in future GIS related projects with CSC, including those requiring translation of tabular data to a geospatial framework, and map based services for disseminating information.

PROJECT TITLE: ***Island-wide Plan to reduce stormwater and aquaculture impacts to estuarine waters***

COLLABORATING PROGRAMS/ CONTACTS:

- Dr. Carolyn Currin, NOAA/NOS Center for Coastal Fisheries and Habitat Research (252)728-8749 carolyn.currin@noaa.gov
- Mike Lopazanski, NC Division of Coastal Management (919) 733-2293, mike.lopazanski@ncmail.net
- Dr. Bill Kirby-Smith, Duke University Marine Lab
- Doug Coker, Education Coordinator, NOAA North Carolina National Estuarine Research Reserve

BROAD NOAA CATEGORY:
__Climate; __Water and Weather; _X_Ecosystems; __Commerce/Transportation; _X_Outreach and Education

PROJECT SUMMARY:
The project will develop a plan to implement innovative technologies to reduce stormwater runoff and aquaculture effluent into estuarine waters, and reduce potential adverse environmental impacts of marine laboratory operations on Pivers Island. The project will also develop a public education program showcasing the technologies and approaches used.

This project directly addresses the NOAA mission to protect, restore and manage the use of coastal and ocean resources through ecosystem-based management. Stormwater runoff is a major source of pollution and decreases water quality in estuaries and the coastal ocean, which in turn can have negative effects on living marine resources and ecosystem production. Continued human development of coastal areas means that the stresses on the coastal ocean from stormwater runoff will increase unless new strategies are developed to reduce its impact. By addressing processes occurring on the land and their impact on stormwater delivery to the ocean, this project supports an ecosystem-based management approach to the problem of maintaining and improving estuarine water quality.

NOAA partners on this project will provide scientific expertise in developing and evaluating innovative approaches to limiting the impacts of stormwater runoff. Duke University Marine Lab will contribute scientific expertise and contribute to education efforts. NC DCM will contribute staff for pubic outreach and education activities associated with this project. Both NOAA and Duke will contribute facility support for the installation of stormwater and aquaculture effluent mitigation projects.

PROJECT TITLE: ***Carolinas Coast: A One-Stop Shop for Marine Observations in the Carolinas***

COLLABORATING PROGRAMS/ CONTACTS:

- University of South Carolina - Dr. Madilyn Fletcher, 803.777.5288, fletcher@biol.sc.edu
- Univ. of North Carolina (Wilmington) - Dr. Lynn Leonard, 910.962.2338, lynnl@uncw.edu
- NOAA NWS, Wilmington WFO – Steven Pfaff, 910-762-8724, steven.pfaff@noaa.gov
- Southeast Coastal Ocean Observing Regional Association – Sandy Bernard, 843.727.6497, sandy.bernard@scseagrant.org
- SC Sea Grant Consortium, Rick DeVoe, 843.727.2078, Rick.DeVoe@scseagrant.org
- NC Sea Grant Consortium, Jack Thigpen, 919.515.3012, jack_thigpen@ncsu.edu

BROAD NOAA CATEGORY:
__Climate; _X_Water and Weather; __Ecosystems; __Commerce/Transportation; __Outreach and Education

PROJECT SUMMARY:
Because up-to-date information on marine conditions is available from a variety of sources, there is a need for clear, coordinated delivery of this information to a general user community of mariners, educators, beach-goers, and other prospective ocean and coastal user groups in the Carolinas. The Carolinas Coastal Ocean Observing and Prediction System - a partnership effort led by the University of South Carolina with NC State and UNCW (www.caro-coops.org) - and the Coastal Ocean Research and Monitoring Program (CORMP) of the University of North Carolina at Wilmington (www.cormp.org), in cooperation with the Southeast Atlantic Coastal Ocean Observing System (SEACOOS; www.seacoos.org) and the Southeast Coastal Ocean Observing Regional Association (SECOORA; www.secoora.org), are now working with the NOAA National Weather Service Forecast Office in Wilmington, NC, to design, develop, and implement a "Carolinas Coast" website (draft: http://nautilus.baruch.sc.edu/carolinas/carolinascoast.php). The website will serve as the new template for the Wilmington Office's "Marine" page (www.erh.noaa.gov/er/ilm/marine/). The proposed website will include current/recent weather and ocean conditions, forecasted conditions (including hazard alerts), and oceanographic models. This partnership between NOAA's NWS and the Carolinas coastal and ocean observing community builds on each group's strengths in meeting the needs of the maritime community.

PROJECT TITLE: ***The Carolinas Coastal Ocean Observing and Prediction System (Caro-COOPS)***

COLLABORATING PROGRAMS/ CONTACTS:

- University of South Carolina: Dr. Madilyn Fletcher, 803-777-5288, fletcher@sc.edu
- North Carolina State University: Dr. Leonard Pietrafesa, 919-555-7777, len_pietrafesa@ncsu.edu
- University of North Carolina at Wilmington: Dr. Lynn Leonard, 910-538-4945, lynnl@uncw.edu
- South Carolina Department of Natural Resources: Dr. Robert Van Dolah, Marine Resources Research Institute, SC Department of Natural Resources, 843-953-9819, vandolahr@dnr.sc.gov
- NOAA NOS Center for Operational Oceanographic Products and Services (CO-OPS) National Water Level Observation Network (NWLON): Thomas Landon, 301-713-2897 x191, Thomas.Landon@noaa.gov
- National Data Buoy Center (NDBC): David Gilhousen, 228-688-2840, dave.gilhousen@noaa.gov
- National Estuarine Research Reserve System: Laurie McGilvray, 301-713-3155 x158, Laurie.McGilvray@noaa.gov
- NWS Wilmington Weather Forecast Office: Steven Pfaff, 910-762-8724, steven.pfaff@noaa.gov
- NWS Raleigh Weather Forecast Office: Kermit Keeter, 919-515-8209, Kermit.Keeter@noaa.gov
- NOAA Coastal Services Center: Dr. Geno Olmi, 843-740-1230, Geno.Olmi@noaa.gov

BROAD NOAA CATEGORY:
__Climate; X_Water and Weather; X_Ecosystems; __Commerce/Transportation; __Outreach and Education

PROJECT SUMMARY:
The coastal ocean of the Carolinas is one of the most ecologically diverse and economically important systems in the Nation. The Carolinas Coastal Ocean Observing and Prediction System (Caro-COOPS) is monitoring and modeling estuarine and coastal ocean conditions in the Carolinas to establish a capability to provide real-time predictions and ultimately forecasts for decision-makers that deal with (1) response to major storms; (2) water quality and transport of pollutants: (3) sediment transport and shoreline stability; and (4) the state of the fisheries.

A fully operational Caro-COOPS will reduce the costs and risks to people, the economy, and natural resources from natural and human-induced hazards and increase coastal communities' ability to adapt to changing conditions, resulting in a balance of environmental and economic benefits. Caro-COOPS is directly relevant to NOAA's mission and its strategic goals, which address environmental assessment and prediction and environmental stewardship (http://www.spo.noaa.gov/).

Caro-COOPS is a partnership among the University of South Carolina's Belle W. Baruch Institute, North Carolina State University, and the University of North Carolina at Wilmington. The program is designed to integrate real-time monitoring of hydrologic and meteorological conditions with state-of-the-art computer models to characterize and predict complex coupled air-land-sea processes. At the heart of Caro-COOPS are a real-time instrumentation network, a sophisticated data acquisition and management system, and a set of advanced numerical models.

In July-August 2003, the first components of the observational network were deployed, and real-time data on ocean, coastal, and/or meteorological conditions can be observed at www.carocoops.org. To facilitate open access and fast distribution of Caro-COOPS data, an integrated data management and analysis system was developed to provide customized search, retrieval, analysis, and visualization of data through an intuitive web interface. The Caro-COOPS modeling system consists of a connected, fully three-dimensional, time dependent, continental margin and estuary coupled hydrodynamic model. The backbone model, developed at NCSU, is an adaptable grid Coastal and Estuarine Modeling and Environmental Prediction System (CEMEPS), which is initially being used for the development of real-time analyses of storm surge and flooding before and during landfall of coastal storms. We are now working directly with the SC Emergency Management Division to construct model output products that can be used in their decision-making process during extreme storm events.

We have established a working relationship with the NOAA National Ocean Service (NOS) Water Level Observation Network and established three additional NWLON stations. Our water level data are streamed directly into their system and are part of the federal backbone of water level measurements. Caro-COOPS oceanographic data are also being transmitted to the NOAA National Data Buoy Center, which has included them in their data distribution capabilities. More recently, Caro-COOPS personnel were identified to assist the National Estuarine Research Reserve System in metadata management for the System Wide Monitoring Program. Furthermore, Caro-COOPS and UNC-W's Coastal Ocean Research and Monitoring Program have been working with the Wilmington Weather Forecast Office on a collaborative web interface project called Carolinas Coast, and Caro-COOPS personnel work with the Raleigh Weather Forecast Office to provide storm information.

PROJECT TITLE: ***Assessing the health of populations of dolphins and sea turtles along the coast of the Carolinas***

COLLABORATING PROGRAMS/ CONTACTS:

- NMFS Southeast Fisheries Science Center at the NOAA Beaufort (NC) Lab; Contact – Dr. Aleta A Hohn, NMFS, 252-728-8797, aleta.hohn@noaa.gov
- NOS, Cooperative Center for Marine Animal Health (CCMAH), Charleston, SC; Contact – Dr. Lori Schwacke, NOS, 843-762-8541, lori.schwacke@noaa.gov
- NOS, Center for Coastal Environmental Health and Biomolecular Research, Charleston, SC; Contact – Wayne McFee, NOS, 843-762-8592, wayne.mcfee@noaa.gov;
- NIST, Hollings Marine Lab, Charleston, SC; Dr. John Kucklick, 843-762-8866, John.Kucklick@noaa.gov
- NCSU College of Veterinary Medicine at Center for Marine Science and Technology, Morehead City, NC; Dr. Craig Harms, 252-222-6339, craig_harms@ncsu.edu
- NC Maritime Museum, NC Dept. of Cultural Resources, Beaufort, NC; Keith Rittmaster, 252-504-2452, krittmaster@ec.rr.com
- NC Dept of the Environment and Natural Resources, Beaufort, NC; Dr. Matthew Godfrey, 252-728-1528, godfreym@coastalnet.com
- SC Dept of Natural Resources, Beaufort, SC; Dr. Al Segars, 843-252-4244, SegarsA@dnr.sc.gov
- Department of Biochemistry and Molecular Biology Laboratory, Medical University of SC, Hollings Marine Lab, Charleston, SC; Dr. Gregory Warr, 843-762-8869, warrgw@musc.edu

BROAD NOAA CATEGORY:
__Climate; __Water and Weather; _x_Ecosystems; __Commerce/Transportation; __Outreach and Education

PROJECT SUMMARY:
As NOAA refocuses it's objectives toward ecosystem management, the health of protected species has become an increasing priority. Within the PPBES Capability "Protected Species Research –Structure and Function" is a mandate to incorporate sublethal natural and human impacts into Tier III Assessments. Furthermore, through the MMPA, NMFS has been mandated to coordinate the collection of health data on marine mammal populations, to correlate health trends with biological, physical and chemical environmental variables, and to conduct effective investigations into the cause of mortality events. These mandates require research on etiology and prevalence of disease, as well as exposures to biotoxins, pollutants, and pathogens that address the health of protected species and the quality of their habitats. We are conducting research to elucidate the health of populations of dolphins and sea turtles along the coast of the Carolinas. Goals of this research are to (a) collect data to help with development of models that incorporate sublethal affects into populations assessments, (2) use large marine vertebrates as sentinels of ecosystem health, and (3) define health parameters in free-ranging populations for use in classifying condition and disease states. Data are collected from temporarily caught dolphins and turtles, from live or dead stranded animals, or from remote dart biopsies that collect blubber and skin samples. An essential component of these studies is to define stock structure, animal movements, and habitat use. To this end we rely on VHF radio and satellite-linked telemetry.

This research is an obligate partnership. NMFS coordinates much of the overall research program, conducts most of the field work in NC and other sites, provides stranding response in NC, and is involved in various laboratory components and data analysis. NOS in SC provides stranding response and conducts life-history research related to protected species along the SC coast. Research veterinary expertise is provided by the Environmental Medicine Consortium at NCSU and SC DNR. In addition, various laboratory tests, such as for antibiotic resistance, are conducted at the NC College of Veterinary Medicine. Contaminant analyses are conducted by NIST; biotoxin analyses at NOS in Charleston. The Medical University of SC collaborates with us to investigate new functional genomic methods for evaluating the health status of dolphins. Health and risk assessment models are being developed by the CCMAH in Charleston. Both the NC DENR and SC DNR are partners in the turtle health assessments and mammal strandings. The NC Maritime Museum is an important partner in the marine mammal stranding network. In addition to the collaborating programs listed above, we use the ARGOS system on NOAA satellites managed by NESDIS and NOAA's CoastWatch sea-surface temperature data. And, of course, we depend on the NWS to inform us about safe weather conditions for our field work.

PROJECT TITLE: ***CI-FLOW – Coastal Inland FLood Observation and Warning Project***

COLLABORATING PROGRAMS/ CONTACTS:

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- Robert Bacon, SC Sea Grant, robert.bacon@scseagrant.org, 843.727.2075
- Len Pietrafesa, North Carolina State University, ljpietra@unity.ncsu.edu
- Jack Thigpen, NC Sea Grant, jack_thigpen@ncsu.edu, 919.515.3012

BROAD NOAA CATEGORY:
__Climate; **X** Water and Weather; __Ecosystems; __Commerce/Transportation; _Outreach and Education

PROJECT SUMMARY:

The National Severe Storms Laboratory (NSSL), National Sea Grant (NSG) College Program, University of Oklahoma (OU), North Carolina State University (NCSU), National Weather Service's Office of Hydrologic Development (OHD), and the North and South Carolina Sea Grant programs participate in a joint project centered in North Carolina areas affected by Hurricane Floyd. The primary demonstration area is the Tar-Pamlico River basin. This project, called CI-FLOW (Coastal, Inland FLooding Observation and Warning), was originally conceived in February 2000 at a meeting arranged by the OAR Director between NSSL and Sea Grant designed to leverage NSSL's capability with Sea Grant Extension's outreach capability. The goal of Project CI-FLOW is to establish a research and demonstration program for the evaluation and testing of new remote sensing technologies and multi-sensor techniques to identify inland and coastal floods and flash floods higher spatial and temporal resolution than is currently available.

Previously funded activities of Project CI-FLOW have been 1) implementation in the Tar River Basin of QPE-SUMS (Quantitative Precipitation Estimation and Segregation Using Multiple Sensors; Gourley et al. 2001), a cutting edge multi-sensor precipitation estimation technique, 2) implementation of a physics-based distributed hydrologic model Vflo (Vieux 2001), and coupling with QPE-SUMS, and 3) coupling of the NCSU Estuary–Lower River Flood model (Xie and Pietrafesa 1999) with output from both QPE-SUMS and the HL-RMS.

In 2004, Vflo was replaced by the OHD's Hydrology Laboratory Research Modeling System (HL-RMS), a distributed model, along with their FLDWAV channel model (Koren et al., 2004). HL-RMS performed very well in the NWS-sponsored Distributed Model Intercomparison Project (DMIP) (Smith et al., 2004; Reed et al., 2004). DMIP garnered participation from 12 leading distributed modeling researchers in Canada, Denmark, New Zealand, China, and the US. DMIP was the first extensive comparison of distributed hydrologic models amongst themselves and to traditional lumped models.

At the present, the NCSU CI-FLOW team is working with OHD and NSSL to demonstrate the utility of using NSSL's real-time precipitation products now called Q2 (an upgrade to QPE-SUMS) and OHD's hydrologic model in watershed-estuarine, storm surge, and water quality modeling. Details on CI-FLOW can be found at http://www.nssl.noaa.gov/wrd/wish/iflow/.

PROJECT TITLE: ***NOAA Traveling Exhibit: 2005 NC Seafood Festival***

COLLABORATING PROGRAMS/ CONTACTS:

- Tom Kriehn, NOAA Weather Service-Newport, tom.kriehn@noaa.gov

BROAD NOAA CATEGORY:
__Climate; _Water and Weather; _Ecosystems; __Commerce/Transportation; _x_Outreach and Education

PROJECT SUMMARY:
Staff members from various National Oceanic and Atmospheric Administration (NOAA) office throughout North and South Carolina manned a "NOAA in the Carolinas" booth at the 2005 North Carolina Seafood Festival. The booth was set up in the "Coastal Yesterday and Today Education Tent in the parking lot at the south end of 9th Street in along the Morehead City waterfront. The theme for the education tent was "Life at the Edge of the Sea." The NOAA booth featured interactive children's learning activities, teacher resources and various NOAA partner program descriptions. Offices represented included NOAA's Undersea Research Center at the University of North Carolina at Wilmington, North Carolina Sea Grant, NOAA's National Ocean Service, NOAA's Marine Fisheries Service, and NOAA's National Weather Service. The booth was manned from 10 am until 6 pm on Saturday October 1st and from 10 am until 5 pm on Sunday October 2nd.

PROJECT TITLE: ***NOAA @ Nauticus***

COLLABORATING PROGRAMS/ CONTACTS:

- Primary Contact—Andrew Larkin, NOAA@Nauticus Project Coordinator, (757) 627-3823, andrew.w.larkin@noaa.gov
- Rich Conti, Executive Director, Nauticus-The National Maritime Center, (757) 664-1000, rich.conti@norfolk.gov
- Michelle Fox, Outreach Coordinator, NOAA Chesapeake Bay Office, (757) 267-3823, michelle.fox@noaa.gov
- John Broadwater, Office of Nat'l Marine Sanctuaries, (757) 599-3122, john.broadwater@noaa.gov
- Jim Dixon, NOAA Office of Coast Survey, (757) 627-7072, jim.dixon@noaa.gov
- Ron Gird, Nat'l Weather Service Outreach Manager, (301) 713-0090

BROAD NOAA CATEGORY:
__Climate; __Water and Weather; __Ecosystems; __Commerce/Transportation; _x_Outreach and Education

PROJECT SUMMARY:
NOAA @ Nauticus is an exciting partnership between the National Oceanic and Atmospheric Administration (NOAA) and Nauticus, The National Maritime Center to promote scientific and environmental literacy and to inform the public about NOAA's programs and activities. Nauticus is a maritime-themed science and education center that attracts over 350,000 visitors a year with special programs and exhibits focused on exploring the power of the sea. NOAA staff from the Office of Coast Survey, the Chesapeake Bay Office and the National Marine Sanctuary Program all work on site at Nauticus. NOAA and Nauticus staff work together on a wide variety of education and outreach projects including exhibits, lecture series, teacher training and the creation of a NOAA Science Camp for summer 2006. Nauticus is becoming a major education and outreach center for the NOAA.

Recent highlights include:

In June of 2005, NOAA opened a new Education Resource Center at Nauticus where educators and interested members of the public can obtain information and educational materials (including curricula) on weather, marine biology, oceanography, the Chesapeake Bay, and atmospheric sciences and related topics.

In June 2005, NOAA's Science on a Sphere, was unveiled at Nauticus as a permanent exhibit. Science On a Sphere (SOS) is an innovative system that uses high-speed computers, projectors and advanced imaging techniques to create the illusion of a 6', rotating Earth suspended in mid-air. NOAA staff work to train Nauticus staff on how to use the Sphere in educational programs for school children and the general public.

In summer 2005, the NOAA @ Nauticus team completed work on a master plan for a suite of new NOAA exhibits entitled "Signals from the Shore, Sea and Sky" that will be located on the museum's third floor. The first phase of these exhibits will focus on NOAA's Chesapeake Bay and Maritime Heritage activities. Installation of these first exhibits will begin in January 2006.

NOAA and Nauticus staff are currently working together on the design of a new exhibit "Treasures of NOAA's Ark" that will debut in the center's changing gallery in March 2006. The exhibit will feature many interesting historical artifacts from NOAA's two hundred year history.

PROJECT TITLE: ***Implementing the National Height Modernization System in NC***

COLLABORATING PROGRAMS/ CONTACTS:

- National Geodetic Survey, Gilbert Mitchell, 301 713 3228 x 114, gilbert.Mitchell@noaa.gov
- North Carolina Floodplain Mapping Program, Department of Crime Control and Public Safety/ Division of Emergency Management, John Dorman, 919 715 5711, John.dorman@ncmail.net
- Federal Emergency Management Agency, Laura Algeo, laura.algeo@dhs.gov
- North Carolina Department of Transportation, Survey and Location Division, Charlie Brown, 919 250 4107, charliebrown@dot.state.nc.us

BROAD NOAA CATEGORY:
__Climate; **X** Water and Weather; __Ecosystems; **X** Commerce/Transportation; **X** Outreach and Education

PROJECT SUMMARY:
Throughout the United States, government entities and businesses have annually spent hundreds of millions of dollars to correct engineering problems caused by subsidence, earthquakes, floods, and other land surface changing phenomena. In North Carolina, the problem has been with hurricanes. The state has been the target of numerous hurricanes that have caused devastating floods not only in the expected tidewater counties, but also unanticipated floods throughout the coastal plain counties. Consequently, the State government recognized the need for updated Flood Insurance Rate Maps (FIRMs) and signed an agreement with Federal Emergency Management Agency to begin the first Cooperating Technical State (CTS). As a FEMA CTS, North Carolina created the North Carolina Floodplain Mapping Program (NCFMP) to update these maps for the entire state. In order to efficiently produce accurate, up-to-date Digital FIRMs, the NCFMP collects elevation data using Light Detection And Ranging (LIDAR) technology, and works with the National Geodetic Survey (NGS) to implement the National Height Modernization System (NHMS) in North Carolina. North Carolina needs the NHMS to be implemented throughout the state to meet NCFMP needs, and many other regional users, for example:

- Support Professional Surveyors and Engineers in NC
- Airport zero visibility landing systems
- Coastal and harbor navigation systems
- Precision agriculture
- Road construction

The ability to utilize accurate real-time heights will save money and lives. Positioning applications need real-time accuracy that cannot be met by classical line-of-sight techniques of measuring heights from precisely located, monumented vertical control points (i.e. benchmarks). Implementing the NHMS in North Carolina will also support the following applications:

- **Floodplain mapping and Geographic Information Systems (GIS) applications**
  - Efficient completion and maintenance of the NC DFIRMs
  - Decreased survey costs associated with floodplain mapping and other mapping/GIS activities
  - More accurate modeling of storm surge and pollution plume trajectories
  - Improved disaster preparedness
  - More accurate digital elevation models (DEMs), better floodplain analysis, and determination of floodplain needs
  - More accurate determination of coastal erosion rates and floodplain boundaries
  - Support the development of the NC Flood Warning system
  - Improved natural resource management decision making through the use of reliable GIS
- **Support the activities of Professional Land Surveyors in NC**
  - Provide vertical control to support activities related to the NCFMP
- **Airport zero visibility landing systems**
  - Improved aircraft navigational aids, obstruction surveys, and other support activities that can enable safer approach and landing procedures
- **Coastal and harbor navigation systems**
  - Improved coastal and harbor navigation systems that can enable safer and more cost-effective shipment of goods
  - Accurate heights to minimize dredging and reduce time that ships wait to unload cargo at North Carolina ports
- **Precision agriculture**
  - Enhanced agricultural practices that can reduce fertilizer use and subsequent pollution run-off
- **Road construction**
  - Increased field survey time savings.

PROJECT TITLE: ***Coastal Ocean Research and Monitoring Program (CORMP)***

COLLABORATING PROGRAMS/ CONTACTS:

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- US Marine Corps Camp Lejeune: Dan Egge, 910-451-7567, Daniel.Egge@usmc.gov
- NWS Wilmington Weather Forecast Center: Michael Caropolo, Steve Pfaff, 910-762-8724 Michael.caropolo@noaa.gov
- NWS Newport NC Weather Forecast Office: Thomas Kriehn, Thomas Kriehn@noaa.gov
- NOAA National Data Buoy Center: Don Conlee, David Gilhousen, 228-688-2840, dave.gilhousen@noaa.gov
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- US Army Corps of Engineers: John McCormick, 910-251-4766, John.W.McCormick@saw02.lusace.army.mil
- NOAA NC Sea Grant: Ron Hodson, Spencer Rogers, Jr. 910-962-2461, rogerssp@uncw.edu
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- Cape Fear River Estuary Program: (New Hanover County, City of Wilmington, UNCW) Michael Mallin, 910-962-2358, mallinm@uncw.edu
- National Estuarine Research Reserve System: Anthony Snider, 910-350-2022, snidera@uncw.edu
- NC Department of Marine Fisheries: Jess Hawkins, 252-726-7021
- NOAA/NMFS/Rutgers Cooperative Marine Education and Research Bluefish Program: Thomas Lankford, 910-962-2381, lankfordt@uncw.edu
- NOAA Center for Coastal Monitoring and Assessment: Tim Wynne, Varis Ransi, Rick Stumpf
- NOAA/Coastal Services Center - Coastal Climatology Products for Recreation and Tourism End Users in SE NC; Pace Wilber (NOAA CSC) or Douglas Gamble, 910-962-3778, gambled@uncw.edu, pace.wilber@noaa.gov
- NC State Ports Authority: Steve Jackson, 910-763-1621
- University of South Carolina: Madilyn Fletcher, 803-777-5288, fletcher@sc.edu
- North Carolina State University: Leonard Pietrafesa, 919-555-7777, len_pietrafesa@ncsu.edu
  WeatherFlow, Jay Titlow (info requested is private), see CORMP buoys at sailflow.com

BROAD NOAA CATEGORY:
__Climate; _x_Water and Weather; _x_Ecosystems; __Commerce/Transportation; _x_Outreach and Education

PROJECT SUMMARY:
The economically important and ecologically diverse Carolinas coastal ocean is one of the most dynamic and complex interactions of the ocean, atmosphere and land anywhere in the nation. This region is vulnerable and its resources--including finfish, shellfish, recreational infrastructure, commercial ports—face serious risk from natural and human induced impacts. There is compelling need to understand and predict coastal maritime conditions in the region, which is made possible only through establishment of observational networks providing reliable and real-time data on ocean and weather conditions. The Coastal Ocean Research and Monitoring Program (CORMP, www.cormp.org) is playing a leading role not only in achieving these ends but, concomitantly, in bringing together important user-based groups and formal partnerships in the region who have need for the data and information derived from the data that is being carefully collected, analyzed, used and archived.

CORMP consists of four focus areas: a series of diverse Ocean Observations; Data Management: Ecosystem Research and Modeling related to fisheries; and Outreach and Education. These areas operate synergistically to: 1) provide a regional hub in a developing national observing system (IOOS); 2) collect and disseminate physical and ecological data; and 3) engage regional partners, stakeholders and end-users in the development and implementation of a sustainable coastal-ocean observing program. CORMP capitalizes on a combination of instrumented moorings, remote sensing and ecosystem models, and traditional ship-based observations to establish baseline conditions, identify responses to stochastic events, predict and verify long-term trends, and identify linkages among coastal ocean ecosystem components.

CORMP has established a series of coastal ocean moorings, four now reporting in real-time and two additional being readied for real-time deployment. In addition, scheduled periodic transects for horizontal measurements between fixed vertical moorings, now further complemented by autonomous WEB glider cruises, all derive data for the extensive CORMP fisheries/coastal ecological program. All data is rapidly becoming available on line, and models are being constructed at NCSU to produce products useful in ecological studies related to fisheries and sediment transport as well as application to models of extreme storm events which so frequently occur along Carolinas coasts. CORMP data is compatible with and shared with USC and NCSU in the extensive Caro-COOPS modeling efforts.

An outstanding element of CORMP is its partnerships and it's educational and outreach efforts. Strong partnerships have been established with the U.S. Marine Corps at Camp Lejeune, where CORMP and Camp Lejeune have jointly funded a mooring built by NDBC and located five miles off the New River Inlet in the midst of the Marine coastal training area. NDBC QA/QC assured data is available to both parties in real time, including waves. The Wilmington Office of the National Weather Service and the U.S. Army Corps of Engineers are strong allies with CORMP. CORMP real-time mooring data is used by the NWS Office in its marine forecasts, and the Corps is working with CORMP's coastal ocean and pier based wave data in its beach renourishment program for SE NC. Other CORMP data is being used by the NC Division of Marine Fisheries as, for example, in the opening and closing of the shrimp season for SE NC. The CORMP educational emphasis is on middle and high school teachers, bringing them into the program on actual cruises, and into laboratories during data analysis for data take-back into classrooms. Twenty such educators participated in the CORMP program this past summer (2005).

PROJECT TITLE: ***Coastal Hazards and Climatologies: Integration Potential in the Carolinas***

COLLABORATING PROGRAMS/ CONTACTS:

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- NOAA/NWS:
  - Southeast River Forecast Center, John Feldt (HIC), john.feldt@noaa.gov, 770-486-0028
  - Hydrologic Services Division (NWS HQ), Glenn Austin and Tom Graziano, glenn.austin@noaa.gov, 301-713-0006 x150
  - Office of Hydrologic Development (NWS HQ), George Smith, george.smith@noaa.gov, 301-713-0640 x117
  - Raleigh Weather Forecast Office, Jeff Orrock (WCM), jeff.orrock@noaa.gov, 919-515-8205 x223
  - Greenville Weather Forecast Office, Tom Kriehn (MIC), thomas.kriehn@noaa.gov, 252-223-5122
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- North Carolina Floodplain Management Program, David Herlong, dherlong@ncem.org, 919-715-5711 x 107
- North Carolina Center for Geographic Information and Analysis, Tim Johnson, tim@cgia.state.nc.us, 919-715-0725
- University of North Carolina, Wilmington, Dr. Lynn Leonard, Principal Investigator, CORMP, 601 S. College Station Road, Wilmington, NC 28403 ph: 910-962-2338 lynnl@uncw.edu; Doug Gamble, Director Laboratory for Applied Climatology Research dougg@uncw.edu
- University of South Carolina, Madilyn Fletcher, Caro-COOPS, Baruch Institute, University of South Carolina, Columbia, SC 29208 ph: 803-777-5288 fletcher@biol.sc.edu; Braxton Davis, Outreach Coordinator
- University of Georgia, David Stooksbury, Georgia State Climatologist
- Florida State University, James O'Brien, Florida State Climatologist
- North Carolina State University, Len Pietrafesa, Al Riordan, Lian Xie

BROAD NOAA CATEGORY**:**
_X_Climate; _X_Water and Weather; _X_Ecosystems; __Commerce/Transportation; __Outreach and Education

PROJECT SUMMARY:
NOAA's North Carolina flood warning enhancement project was an example of leveraging across NOAA resources and a host of federal and state partners to meet the needs of the State of North Carolina after the flooding disaster caused by Hurricane Floyd in 1999. The partnership between NWS and NOS brought about enhanced graphical **flood forecast information**, built on the USGS National Stream Gauging program backbone and the data and models available from the FEMA Map Modernization Program, part of the National Flood Insurance Program. The existing **observation network and its data** were used as input into enhanced modeling and mapping methods and ultimately provided enhanced flood forecasts to customers. The State of North Carolina also developed enhanced on-line mapping capability to deliver this system to emergency managers and the public. Additional work in the future may include **climatological analysis** to determine future flood risk based on ensemble streamflow prediction.

The NOAA Cooperative Program for Climate & Weather Impacts on Society and the Environment (CWISE), a collaboration between NOAA's National Climatic Data Center, NOAA's Coastal Services Center, NC State University and its partners, will produce in 2006 a new statistically-driven mechanism for **forecasting hurricane climatologies** in the southeast. The method uses five easily obtainable ocean/atmosphere indices to predict the relative frequency of landfall hurricanes in the southeastern U.S. The forecast period can be a month to a whole hurricane season. Upcoming CWISE discussion will focus on making this new climatological index operational. CWISE will also develop a system for forecasting the spatial extent and strength of the seabreeze system. The research for developing this forecast focuses on the areas between Wilmington, NC, and Savannah, GA. Results will be relevant to utility industries, human health agencies, and homeland security planners.

The CWISE program in 2005, with funding from NOAA Coastal Services Center and other assistance from NOAA National Climatic Data Center, has partnered with CORMP to develop a Web site focused on the climate and weather needs of the recreation and tourism industry of coastal North Carolina; and with State Climatologists from Georgia and Florida and Georgia Sea Grant to develop a Web site focused on the climate and weather needs of recreational fishermen from North Carolina to Alabama. Both of these pilot studies also were called for during a user needs workshop held in 2003, a partnership between the Coastal Services Center, NCDC, and the SC Department of Natural Resource's Southeastern Regional Climate Center.

PROJECT TITLE: ***Climate & Weather Impacts on Society & the Environment (CWISE) and Interactively coupled NOAA Programs in the Carolinas***

COLLABORATING PROGRAMS/ CONTACTS:

- North Carolina State University, Dr. Len Pietrafesa, (919) 515-7777, leonard_pietrafesa@ncsu.edu
- NOAA/NESDIS/NCDC/Dr. Tom Karl (Director)
- NOAA/NOS/CSC/Ms. Margaret Davidson (Director)
- NOAA/OAR/NSGCP/Dr. Ron Baird_(National Director)
- NOAA/NWS/NSSL/Dr. Kevin Kelleher_(Assoc. Director)
- NOAA/NMFS/Dr. Bill Hogarth (Assistant Administrator)

BROAD NOAA CATEGORY:
_X_Climate; _X_Water and Weather; _X_Ecosystems; __Commerce/Transportation; _X_Outreach and Education

PROJECT SUMMARY:
The Climate & Weather Impacts on Society & the Environment (CWISE) addresses phenomena ranging from the frequency of occurrence and paths of Tropical Cyclones and Extra-Tropical Cyclones to precipitation variability and mapping to wind and wave field temporal and spatial variability to Sea Surface Temperature mapping and space and time history to sea level rise variability to the impacts, past, present and future of these and other events and phenomena on the communities and ecological systems of the Carolinas specifically in the context of national trends and on the global temperature trend. All of these issues are of direct relevance to NOAA's four goal areas and three are highlighted. NCDC and CSC have determined the thrust areas of interest and faculty, staff and students are working with their federal center partners to produce new information, products and services. Examples of the progress and status on all of the above are presented. Also, couplings to other NOAA programs, such as Caro-COOPS, CI-FLOW, CORMP and A-FISH are presented.

PROJECT TITLE: ***Bycatch Reduction of Marine Mammals in Mid-Atlantic Fisheries***

COLLABORATING PROGRAMS/ CONTACTS:

- Dr. Steve Rebach, Associate Director, North Carolina Sea Grant, Box 8605, 101-E 1911 Building, Raleigh, NC 27695-8605, Phone: 919-515-9104, Fax: 919-515-7095, e-mail: srebach@ncsu.edu
- Stacey Carlson, NOAA Fisheries, Southeast Regional Office, 263 13th Avenue South, St. Petersburg, FL 33701, (727) 551-5780 Stacey Carlson, NOAA Fisheries, Southeast Regional Office, 263 13th Avenue South, St. Petersburg, FL 33701, (727) 551-5780

BROAD NOAA CATEGORY:
__Climate; __Water and Weather; _X_Ecosystems; __Commerce/Transportation; __Outreach and Education

PROJECT SUMMARY:
This program will provide competitive funding for innovative and practical proposals that seek to reduce incidental takes (bycatch) of the Western North Atlantic coastal bottlenose dolphin under the BDTRP process and the short- and long-finned pilot whale under the PLTRP process. Bycatch of bottlenose dolphins occurs in coastal gillnet fisheries targeting various species in the mid-Atlantic region, primarily in North Carolina and Virginia. Bycatch of short- and long-finned pilot whales occurs in the pelagic longline fishery targeting swordfish, tuna, and shark in the mid-Atlantic region, primarily in offshore waters from North Carolina to New Jersey. NMFS is specifically interested in receiving gear research proposals for the coastal gillnet and pelagic longline fisheries, but is also interested in receiving gear research proposals involving other fisheries in which bycatch of these species occurs along the mid-Atlantic and southeast Atlantic coast. This competition will be open to investigators primarily in the mid-Atlantic region, but we will also accept well-crafted proposals from other east coast investigators capable of performing their research in areas where such bycatch exists.

This gear research program will fund projects with a strong likelihood of reducing potential bycatch of coastal bottlenose dolphins and short- and long-finned pilot whales. Projects must comply with applicable regulations under the Magnuson-Stevens Fishery Conservation Management Act and the Marine Mammal Protection Act.

PROJECT TITLE: ***Bottlenose Dolphin Take-Reduction Gear Research Program***

COLLABORATING PROGRAMS/ CONTACTS:

- Dr. Steve Rebach, Associate Director, North Carolina Sea Grant, Box 8605, 101-E 1911 Building, Raleigh, NC 27695-8605, Phone: 919-515-9104, Fax: 919-515-7095, e-mail: srebach@ncsu.edu
- Stacey Carlson, NOAA Fisheries, Southeast Regional Office, 263 13th Avenue South, St. Petersburg, FL 33701, (727) 551-5780

BROAD NOAA CATEGORY:
__Climate; __Water and Weather; _X_Ecosystems; __Commerce/Transportation; __Outreach and Education

PROJECT SUMMARY:
Gillnet operations along the Atlantic coast, specifically North Carolina, are known to experience dolphin bycatch in their gear. North Carolina Sea Grant has partnered with the National Marine Fisheries Service to offer a competitive funding opportunity that supports collaborative research among the commercial fishing industry, scientists and other interested parties. to provide conservation recommendations to reduce bycatch. Recommendations included various gear research projects that can be compiled into a Bottlenose Dolphin Take Reduction Plan.

Gear research in gillnet fisheries will have priority. However, the committee also will consider gear research proposals in other fisheries experiencing bottlenose dolphin bycatch along the mid-Atlantic and southeast Atlantic coast. Projects must be consistent with applicable regulations of the Magnuson-Stevenson Act and the Marine Mammal Protection Act. Proposals also must target gear research or animal behavior related to interactions with commercial fisheries. Individual awards can be up to $50,000.

PROJECT TITLE: ***Educating Anglers about Catch-and-Release in Highly Migratory Species Fisheries***

COLLABORATING PROGRAMS/CONTACTS:

- North Carolina Sea Grant: Jack Thigpen, jack_thigpen@ncsu.edu, 919-515-3012; Sara Mirabilio, saram@csi.northcarolina.edu, 252-475-3663; Scott Baker, bakers@uncw.edu, 910-962-2491; Brian Efland, brian_efland@ncsu.edu, 252-222-6314; Ann Green, agcarver@unity.ncsu.edu, 919-515-9070; Ronald Hodson, ronald_hodson@ncsu.edu, 919-515-2455.
- N.C. Division of Marine Fisheries: Mike Marshall, NC Division of Marine Fisheries, Morehead City, NC; Louis Daniel, NC Division of Marine Fisheries, Morehead City, NC.
- National Marine Fisheries Service: Bill Price (now retired); Jack Dunnigan; Chris Rogers, NMFS, HMS Division, Green Belt, MD; Russell Dunn, St. Petersburg, FL; John Merriner, NMFS, NOAA Lab, Beaufort, NC.
- N.C. Charterboat Captains and Private Anglers: Frank Gromadzki, fisherman, Smyrna, NC; Dennis Heine, boat captain, Smyrna, NC; Donnie Lee, Boat Captain, Atlantic Beach, NC; Crystal Watters, Blue Rock Marlin Tournament, Morehead City, NC; Heather Maxwell, Pirate's Cove Marina, Manteo, NC; Donald Gergely, Swansboro, NC.
- South Carolina Sea Grant: Amber Van Harten, Fisheries Specialist, Beaufort, SC.
- Virginia Sea Grant: Jon Lucy, Virginia Institute of Marine Science, Gloucester Point, VA.
- Coastal Conservation Association: Harris Huddle, New Bern, NC.
- North Carolina State University: Steve Smutko, Raleigh, NC.

BROAD NOAA CATEGORY:
__Climate; __Water and Weather; _x_Ecosystems; __Commerce/Transportation; __Outreach and Education

PROJECT SUMMARY:
For several years, North Carolina Sea Grant, NOAA's National Marine Fisheries Service and the N.C. Division of Marine Fisheries have been working with the recreational fishing community – and in particular the charter boat industry, to increase the education level regarding highly migratory species – such as billfish and tunas – and to increase the use of appropriate gear for sportfishing that focuses on catch and release.

North Carolina Sea Grant collaborated with the Highly Migratory Species (HMS) Management Division of the NOAA Fisheries on a pilot project to better understand recreational anglers information needs regarding highly migratory species in Atlantic and Gulf of Mexico waters.

A professionally facilitated workshop was conducted on February 18 and 19, 2004 in New Bern, North Carolina and brought together a purposively selected group of opinion leaders from the following communities: offshore charter boat captains, private offshore recreational anglers, offshore fishing tournament organizers, Sea Grant fisheries extension specialists, NMFS fisheries managers and fisheries management staff from the North Carolina Division of Marine Fisheries. They were led through a facilitated process to determine the best ways for NMFS to reach recreational anglers with information on highly migratory species and identify the communications issues related to new regulations affecting theses species. This group discussed challenges and developed solutions for improving communications between NMFS HMS Division and recreational anglers.

The primary focus of the panel members was on finding ways to improve the collection and dissemination of information on recreational fisheries management for blue fin tuna and billfish. Quotas, permitting, gear requirements, and data collection and reporting were discussed at length. The panel completed its task by developing a set of eleven recommendations for improving NMFS communications, and two recommendations related to improvements in management and enforcement.

Activities so far include:

- The facilitated workshop.
- A feature story in *Coastwatch* magazine, for which 10,000 copies of the article were reprinted and distributed at tournaments and expos.
- A 23-page report that describe the process and outcomes.
- A PowerPoint presentation that describes the process and outcomes.
- A poster presentation at the 2005 American Fisheries Society annual meetings.
- Joint booths at major fishing shows and tournaments, such as XXX.
- A DVD being developed to demonstrate proper gear selection and rigging.
- A poster outlining the partnership presented at the 2005 American Fisheries Society meeting.

PROJECT TITLE: ***Status and Risk posed by the invasive Indo-Pacific lionfish to North Carolina Hard bottom Communities***

COLLABORATING PROGRAMS/ CONTACTS:

- NOAA Center for Coastal Ocean Science and Service, Paula Whitfield, paula.whitfield@noaa.gov, (252) 728-8714
- NOAA Undersea Research Center at the University of North Carolina--Wilmington, Andrew Shepard, 910 962-2446, sheparda@uncw.edu
- NOAA/NMFS Beaufort Laboratory, Roldan Munoz 252 728-8613
- NOAA/NMFS Panama City Laboratory, Andy David 850 234-6541 ext 208
- University of North Carolina Wilmington (UNCW/CMS), Wilson Freshwater, 910 962-2375
- The Florida Aquarium, Tampa, Fl, Casey Coy, (813) 367-4019
- NOAA/NMFS Narragansett, RI, Jonathan Hare (401) 782-3295

BROAD NOAA CATEGORY:
__Climate; __Water and Weather; _x_Ecosystems; __Commerce/Transportation; __Outreach and Education

PROJECT SUMMARY:
Since August 2000 the invasive Indo-Pacific lionfish has been reported along the East Coast of the United States from Florida to Cape Hatteras North Carolina including Bermuda and more recently the Bahamas. The impact of this venomous predator to native Atlantic communities is just beginning to be examined. In 2004 and 2005 the first NOAA led research surveys were conducted along the coast of North Carolina, a partnership between NOAAs Undersea Research Center in Wilmington and the NOAA laboratory in Beaufort North Carolina. These data revealed not only the widespread distribution of lionfish but densities of lionfish that now rival that of many native grouper species.

Our primary objective is to continue and expand our research on the invasive lionfish distribution, abundance, biology and ecology in the Atlantic in order to determine the impact that the lionfish invasion will have on native communities. We have developed baseline lionfish density estimates which will allow future population trends to be determined. We also have preliminary life history and genetic data from the specimen collections of August 2004 and Feb 2005. But more specimens are needed especially from the southern extent of the invasion. We will also continue to examine lionfish temperature tolerances, and to study lionfish ecology by conducting in-situ tagging studies at selected locations. Specifically, we propose four main research objectives:

- Objective 1: Quantify lionfish, grouper (Serranid:epinephaline) and native tropical species abundance at 12 sites off the North Carolina shelf to compare with baseline data for assessment of trends in population size.
- Objective 2: Provide genetic, life history, and ecological information to describe population demographics, trophic role, and behavior of NC lionfish and specimens at the southern extent of their range (i.e. Florida, Bahamas)
- Objective 3: Determine the inshore (continental shelf) limit of lionfish through in-situ bottom water temperature collections and field observations.
- Objective 4: Increase education and public awareness about the threat of invasive species through a formal partnership and public outreach effort with two aquariums and other AZA member facilities.

All of this work is facilitated in partnership with NURC at UNCW. First, they provided advanced technical dive training for qualified NOAA divers, a necessity due to the relatively deep diving depths where lionfish are found (> 90ft). Second, NURC also assists in the scientific data collection including temperature sensor deployment and retrieval, video and still photo documentation. They also have been exclusively authorized by NOAA to conduct oversight of decompression diving activities to insure the safety of all divers and support personnel. Their role in this research cannot be overstated because without the support of NURC conducting deep water diving research for NOAA would not be possible.

NMFS partnerships have also been formed at the NOAA laboratories in Beaufort, NC and Panama City, FL. Other partnerships include the University of North Carolina in Wilmington and The Florida Aquarium in Tampa, FL.

NOAA has identified invasive species as one of the five main threats to coastal ecosystems today. This research directly supports NOAA goals as well as several other legislative mandates, such as Non-indigenous Aquatic Nuisances Species Prevention and Control Act of 1990, The National Invasive species Act of 1999 and the invasive species executive order no.13112.